

ABSTRACT

BACKGROUND & OBJECTIVES

It is important to have good marginal seal and better bond strength for the longevity of restorative material, thereby reducing the marginal leakage which is the precursor of secondary caries, staining of restoration, tooth discoloration, marginal deterioration, postoperative sensitivity and pulpal pathology. Several factors contribute to the high incidence of recurrent caries in the gingival area. These include improper restorative technique by the clinician, plaque accumulation due to patient difficulty in cleaning and lack of patient compliance with proper oral hygiene. It is therefore critical to achieve a seal on the gingival margin of class II sandwich restorations.

The objective is to evaluate and compare the shear bond strength and microleakage in premolars using Biodentine – tricalcium silicate-based bioactive restorative material and resin modified glass ionomer cement with Adper single bond (etch and rinse adhesive system) and Universal bond – 3M (1 step self etch adhesive system) adhesive systems.

MATERIALS AND METHODOLOGY

80 premolars extracted for orthodontic purpose were collected. The samples were divided into two groups namely, Group A (Biodentin group) and Group B (resin modified glass ionomer cement group respectively. Each group is then further subdivided into subgroup1 (Adper single bond) and subgroup 2 (Universal Bond). The occlusal surfaces of the tooth were ground flat and PVC molds were stabilized over flat dentin surface. It is then filled according to the groups ascertained which is then restored with composite resin. Shear bond strength were evaluated with

Universal Testing Machine (INSTRON) using a steel knife edge (1mm thickness) at a cross head speed of 0.5 mm/ minute.

Standardized class II cavities were prepared in premolars and restored with tricalcium silicate-based restorative material (Biodentine) and resin modified glass ionomer cement and was applied with adhesives, according to groups ascertained. After the application of adhesives, composite resin material is restored, using open sandwich technique. The samples were then subjected to 1000 thermocycles followed by methylene blue dye penetration. The extent of microleakage was examined using stereomicroscope at 40X magnification.

RESULTS

The result showed that the shear bond strength of Biodentine with Adper single bond was better with the mean value of 12.4 and there was a statistical significance when compared to other groups and RMGIC with Adper single bond shows less microleakage with the mean value of 2.7 when compared to other groups but there was no statistical significance.

CONCLUSION

Biodentine with Adper single bond shows better shearbond strength which is followed by RMGIC with Universal bond (self etch system) and RMGIC with Adper single bond and then Biodentine with Universal bond.

RMGIC with Adper single bond shows less microleakage when compared to RMGIC with Universal bond which is then followed by Biodentine with Adper single bond and then the Biodentine with Universal bond.

KEYWORDS

Shearbond strength, Microleakage, Biodentine, Resin modified glass ionomer cement, Adper single bond, Universal bond.
